<<数值分析>>

图书基本信息

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内容概要

美国萨奥尔编著的《数值分析》是一本优秀的数值分析教材，书中不仅全面论述了数值分析的基本方法，还深入浅出地介绍了计算机和工程领域使用的一些高级数值方法，如压缩、前向和后向误差分析、求解方程组的迭代方法等。
每章的“实例检验”部分结合数值分析在各领域的具体应用实例，进一步探究如何更好地应用数值分析方法解决实际问题。
此外，书中含有一些算法的matlab实现代码，并且每章都配有大量难度适宜的习题和计算机问题，便于读者学习、巩固和提高。

作者简介

萨奥尔（Timothy Sauer），美国乔治梅森大学数学系教授。
1982年于加州大学伯克利分校获得数学专业博士学位，师从著名数学家Robin Hartshorne。
他的主要研究领域为动力系统、计算数学和数学生物学。
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书籍目录

章节摘录

版权页： 插图： We must truncate the number in some way,and in so doing we necessarily make a small error.One method,called chopping,is to simply throw away the bits that fall off the end-that is,those beyond the 52nd bit to the right of the decimal point.This protocol is simple,but it is biased in that it always moves che result toward zero. The alternative method is rounding.In base 10,numbers are customarily rounded up if the next digit is 5 or higher,and rounded down otherwise.In binary,this corresponds to rounding up if the bit is 1.Specifically,the important bit in the double precision format is the 53rd bit to the right of the radix point,the first one lying outside of the box.The default rounding technique,implemented by the IEEE standard,is to add 1 to bit 52(round up)if bit 53 is 1,and to do nothing(round down)to bit 52 if bit 53 is 0,with one exception: If the bits following bit 52 are 10000...,exactly halfway between up and down,we round up or round down according to which Choice makes the final bit 52 equal to 0.(Here we are dealing with the mantissa only,since the sign does not play a role.) Why is there the strange exceptional case? Except for this case,the rule means rounding to the normalized floating point number closest to the original number-hence its name,the Rounding to Nearest Rule.The error made in rounding will be equally likely to be up or down.Therefore,the exceptional case,the case where there are two equally distant floating point numbers to round to,should be decided in a way that doesn't prefer up or down systematically.This is to try to avoid the possibility of an unwanted slow drift in long calculations due simply to a biased rounding.The choice to make the final bit 52 equal to 0 in the case of a tie is somewhat arbitrary,but at least it does not display a preference up or down.Problem 8 sheds some light on why the arbitrary choice of 0 is made in case of a tie.

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